

## Claims

What is claimed is:

1. A rotating shaft for pivotally connecting the rotary wing to the body of a rotary-wing type digital mobile communication equipment, wherein the rotating shaft comprises:

- a spindle formed at both ends thereof with a first positioning portion and at mid-section thereof with a rotary portion;

- a fixing member hitched on the first positioning portion of the spindle and to be positioned to the spindle fixedly and formed with a limit block;

- a rotary member pivotally disposed on the rotary portion of the spindle;

- a rotatable limit component pivotally disposed on the rotary portion of the spindle and positioned between the fixing member and the rotary member and provided with a radially protruding first protruding block;

the rotary member is coupled to the rotatable limit component and leaves some rotating space, when the rotary member rotates, it drives the rotatable limit component rotating, and when the first protruding block formed on the rotatable limit component is blocked by the limit block formed on the fixing member, the rotary member has rotated through 180 degrees.

2. A rotating shaft as claimed in claim 1, wherein the rotatable limit component is ring-shaped, the rotary member is formed at an end surface thereof adjacent to the rotatable limit component with an axially extending ring-shaped protrusion which is provided with an opening, the first protruding block of the rotatable limit component is embedded in the opening whose width is larger than that of the first protruding block; when the rotary member rotates about the spindle, the ring-shaped protrusion comes into contact with the protruding block to drive the rotatable limit component rotating.

3. A rotating shaft as claimed in claim 1, wherein the rotatable limit component in turn comprises a first rotary member, a rotatable limit

member and a second rotary member; the second rotary member is fixedly connected to the rotary member and formed at the interior circumference thereof with a plurality of first open slots; the first protruding block is formed on the rotatable limit member which is formed at the interior circumference thereof with a plurality of second open slots in correspondence with the locations of the first open slots; the first rotary member is provided with a plurality of axially extending third protruding blocks which are inserted into the first open slots formed on the second rotary member through the second open slots formed on the rotatable limit member; the circumferential width of the second open slots is larger than that of the third protruding blocks; when the rotary member rotates, it drives the first rotary member and the second rotary member rotating and simultaneously drives the rotatable limit member rotating.

4.A rotating shaft as claimed in claim 3, wherein the second rotary member is formed thereon with a plurality of second protruding blocks and the rotary member is correspondingly formed with a plurality of slots, the second protruding blocks are inserted into the slots, so that the second rotary member is fixedly connected to the rotary member.

5.A rotating shaft as claimed in claim 3, wherein the second rotary member is formed thereon with a plurality of slots and the rotary member is correspondingly formed with a plurality of second protruding blocks, the second protruding blocks are inserted into the slots, so that the second rotary member is fixedly connected to the rotary member.

6.A rotating shaft as claimed in claim 3, wherein the rotating shaft further comprises a self-locked positioning member and two elastic slices covered each other, the mid-section of the spindle is also formed with a second positioning portion, the self-locked positioning member and the two elastic slices are in turn formed at one side of the rotary member away from the fixing member and hitched on the second positioning portion of the spindle and to be positioned to the spindle fixedly; the self-locked positioning member is formed at one side opposite to the

rotary member with two protrusions which are radially symmetrically arranged at 180 degrees, the corresponding side of the rotary member is formed with two grooves corresponding to the two protrusions.

7. A rotating shaft as claimed in claim 6, wherein the rotary member further comprises an cap positioned at the other side opposite to the fixing member and fixedly hitched on the first positioning portion of the spindle.

8. A rotating shaft as claimed in claim 7, wherein the first positioning portion formed on the spindle is a polygonal-sectional protrusion, the center holes of the fixing member and the cap are disposed with corresponding polygonal holes.

9. A rotating shaft as claimed in claim 6, wherein the second positioning portion of the spindle are two plane portions, the center holes of the self-locked positioning member and the two elastic slices are formed with corresponding linear edge.

10. A rotating shaft as claimed in claim 1, wherein the spindle is hollow, through which passes an electrical connecting cable or a flexible printing plate disposed between the rotary wing and the body.

11. A rotating shaft as claimed in claim 1, wherein the fixing member and the rotary member are both formed with a plurality of screw holes.

12. A method of mounting the rotating shaft as claimed in claim 1 between the mobile telephone body and the rotary wing, wherein comprises following steps:

a. to provide a rotating shaft assembly assembled with a plurality of members;

b. to provide a mobile telephone body, on the upper end of the front shell of the body is formed with a sunken mounting-space;

c. to place the rotating shaft into the mounting-space of the front shell of the mobile telephone body, and to fixedly mount the rotary member of the rotating shaft inside the front shell of the mobile telephone body;

d. to provide a rotary wing of the mobile telephone;

e. to fixedly mount together the back shell of the rotary wing of the

mobile telephone and the fixing member of the rotating shaft.

13. A method of mounting the rotating shaft between the mobile telephone body and the rotary wing as claimed in claim 12, wherein there is provided with a first acute angle between the centerline of the mounting-space formed on the front shell of the mobile telephone body and the horizontal datum plane of the front shell of the mobile telephone body, and the mounting angle formed between the back shell of the rotary wing and the rotating shaft is set a second acute angle, the first acute angle and the second acute angle are the complementary angles to each other.

14. A method of mounting the rotating shaft between the mobile telephone body and the rotary wing as claimed in claim 13, wherein the depth of the mounting-space of the body front shell is in correspondence with the height of the rotating shaft, so that the rotating shaft is aligned with the body front shell when the rotating shaft is disposed in the mounting-base.